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____ *Z232-485 Serial Port Converter* _____

The ***Z232-485*** Serial Port Converter is a full-duplex RS232 to RS485 serial port converter, connector compatible with standard PC COM ports and NMC control modules (***PIC-SERVO***, ***PIC-STEP***, ***PIC-I/O***). Up to 32 NMC modules can be interconnected to a single RS232 port through the ***Z232-485*** converter at baud rates from the default of 19,200 up to 115,200.

The ***Z232-485*** Serial Port Converter also has a 40 pin header socket which can be used with our optional ***Simple Sequencer*** stand-alone controller, or with a Core Module processor card (CM71xx or CM72xx) from Z-World Engineering. Either of these processor cards allow you to create stand-alone NMC control systems, or it can be used as an intelligent command processor in conjunction with a host computer.

Note: the ***Z232-485*** is not designed for use with half-duplex RS485 networks.

1. Use as a Conventional Converter

For use as a conventional RS232 to RS485 converter, jumpers JP3 and JP4 should both be set in the 1-2 position. This will directly convert RS232 signals to RS485 and vise versa.

The female DB9 connector (P1) can be used with a straight (*not* a null modem) DB9 Male / DB9 Female extension cable with standard PC COM ports. The 10 pin header connector (JP1) can be used with 10 pin flat ribbon cables (with standard IDC type connectors) to interconnect to NMC control modules. For NMC network interconnect cables longer than 3 meters, it is recommended that you use twisted-pair flat ribbon cable.

Logic power (7.5v to 12v D.C., 500 ma typ.) to the ***Z232-485*** converter and to NMC control modules can be supplied as a single point and distributed over the NMC network flat ribbon cables, or it can be supplied to the various boards individually. To interconnect the ***Z232-485***'s logic power to the network connector, insert a jumper on JP5 (default position); remove the jumper to power the board separately.

Typically, if all NMC control modules and the ***Z232-485*** converter share the same logic power supply, power is supplied via connector JP6 on the ***Z232-485*** board. If this is the case, make sure that jumper JP5 is installed.

Please see *Section 4* for jumper and pin definitions.

2. Use with Stand Alone Processor Cards

The socket JP2 is designed to accept our ***Simple Sequencer*** processor card or a Core Module processor card (CM71xx or CM72xx) from Z-World engineering to create stand-alone motion control systems.

The ***Simple Sequencer*** is a very simple programmable controller for programming fairly simple sequences of motion or other actions. It is programmed using a simple Windows programming environment which requires no formal programming skills. (Please refer to the ***Simple Sequencer*** documentation for complete details.)

The Core Module processor card from Z-World is a Z180 microprocessor with program and data memory, a small amount of EEPROM, two serial ports, and a variety of other peripherals. It can be programmed in C using Z-World's Dynamic C development system.

If jumpers JP3 and JP4 on the ***Z232-485*** are installed in the 2-3 position, RS232 signals from a host will be connected to serial port 0 of the ***Simple Sequencer*** or the Come Module, and the RS485 signals from the NMC network will be connected to serial port 1 of the ***Simple Sequencer*** or the Core Module. In this configuration, either processor card can be used as a stand-alone controller, or alternately, an intelligent command processor between a host and the network of NMC controllers.

Version 2 of the ***Z232-485*** Serial Port Converter has a set of pads for an optional lithium battery which is used for battery backup of the Core Module's RAM. If your application requires the RAM contents to be saved on power-down, you should remove the jumper wire in the location marked BAT1 and solder a 3v battery (Panasonic BR2032-1HE) into place. Note: the jumper wire is required if you do not have a battery. (Note: Version 1 of this board does not have the battery backup option.)

The Core Module processor cards and the Dynamic C programming environment are available directly from Z-World Engineering (see *Section 5* for contact information).

Logic power connections are made as described in *Section 1*.

3. High-speed Operation

The NMC control modules can communicate at rates up to 115,200 Baud, but not all PC COM ports can run at this speed. In addition, some processors cannot keep up with high data input rates and may drop characters. Therefore, a COM port which uses a 16550 UART (with a 16 byte buffer) is recommended. Another potential problem is that some COM port RS232 drivers do not have a sufficient signal rise time to operate reliably at 115,200 Baud. A simple fix which usually solves this problem is to solder a 2.0K ohm resistor between pin 2 and pin 13 of the MAX232 I.C. (or equivalent) on the ***Z232-485*** converter, effectively providing a boost to the RS232 transmit signal. Please refer to the schematic in *Figure 1* for details. (Version 2 of the ***Z232-485*** converter board has a set of pads marked R4 for this optional 2.0K ohm resistor.)

4. Connectors, Jumpers and Specifications

Network Connectors: JP1

Pin	*Definition*
1	***Z232-485*** XMT+
2	***Z232-485*** XMT-
3	***Z232-485*** RCV+
4	***Z232-485*** RCV-
5	N.C.
6	GND
7	Logic power (7.5 - 12vdc)
8	GND
9	Logic power (7.5 - 12vdc)
10	GND

Logic Power Connector: JP6

Pin	*Definition*
1	Ground (towards the right edge of the board)
2	7.5 - 12vdc

RS232 Connector: P1

Pin	*Definition*
1	N.C.
2	XMT
3	RCV
4	N.C.
5	Ground
6	N.C.
7	N.C.
8	N.C.
9	N.C.

Jumpers:

Jumper	*Description*
JP3,JP4	Jumper in the 1-2 position for normal use (default position) Jumper in the 2-3 position for use with optional Core Module processor cards (pin 1 is towards the bottom of the board)
JP5	Logic power interconnection. Inserting JP5 connects logic power to network connector JP1. (default = inserted)

Specifications:

Dimensions:	2.1”L x 3.1”W x 0.90”H
Mounting holes:	0.156” dia., 4 @ 1.80” x 2.45”
Maximum baud rate:	115,200
Optional Backup Battery:	3v Lithium
	Panasonic BR2032-1HE (190 mAh)
Power Consumption:	50 ma @ 7.5 - 12vdc

5. Contact Information

Additional information may be found from these sources:

J R Kerr Web Site **www.jrkerr.com**

Complete information about NMC controllers and accessories including the ***PIC-SERVO*** and the ***PIC-I/O*** controller modules. Test programs and example code and application notes are also available.

Z-World Engineering **www.zworld.com**

Information regarding the Z-World Z180 Core Module processor cards and their Dynamic C code development tools.

HdB Electronics **1-800-287-9432**

Distributor of ***PIC-SERVO*** products as well as of other electronic components, accessories and tools. Fax: 1-650-368-1347, Phone (from outside US): 1-650-368-1388.

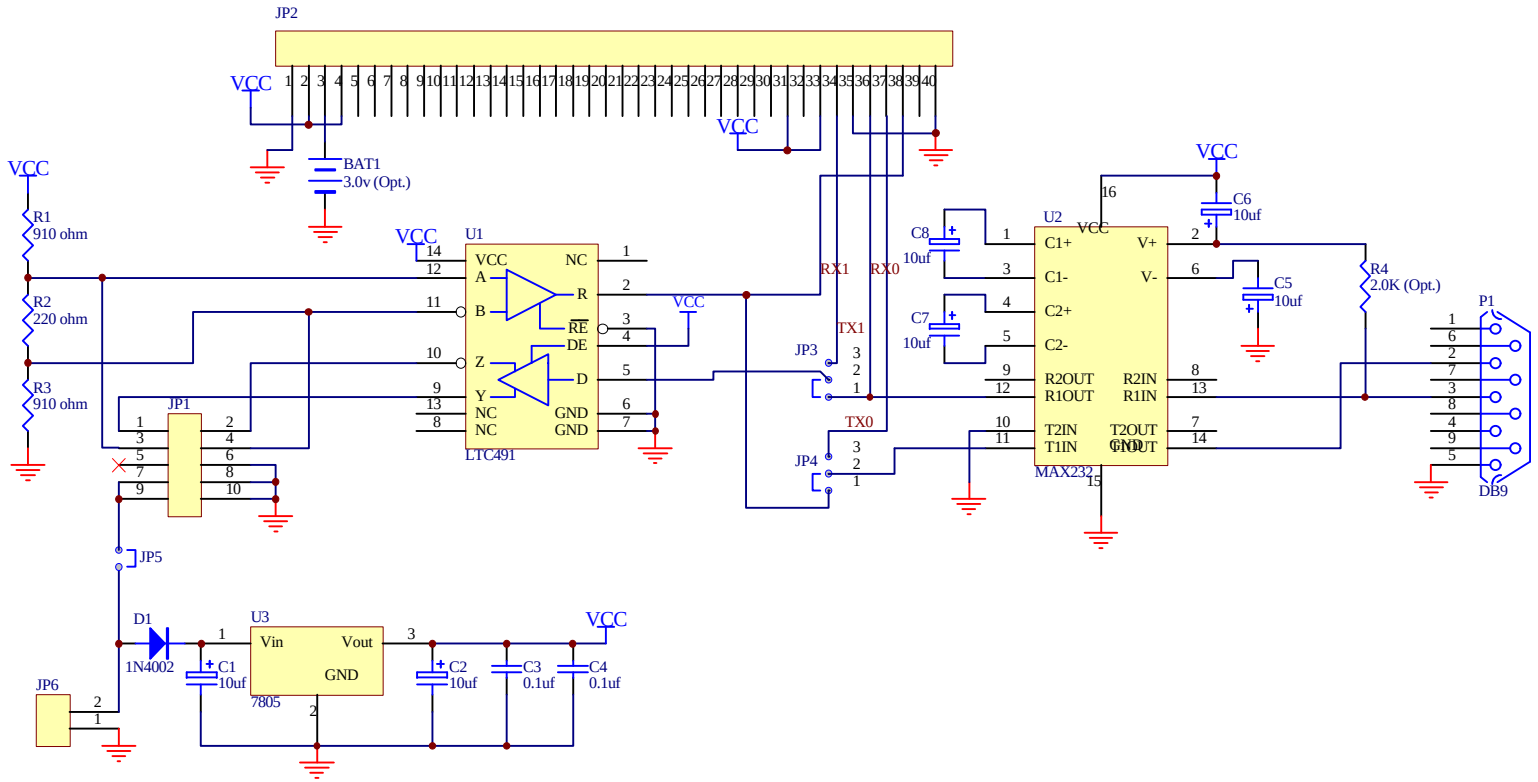

Figure 1 - ***Z232-485*** Converter Board Schematic